

We claim:

1. A process for preparing propylene oxide, which comprises at least the steps (iii) and (iv)
(iii) separating off propylene oxide from a mixture (M1) comprising propylene oxide and at least one solvent by distillation in a distillation column, giving a bottom stream and a vapor stream consisting essentially of propylene oxide;
(iv) compressing the vapor stream obtained in (iii) by means of at least one compressor to give a compressed vapor.
2. A process as claimed in claim 1, wherein the at least one solvent is methanol.
3. A process as claimed in claim 1 or 2, wherein the distillation column used for the separation by distillation in (iii) is operated at a pressure in the range of from 450 to 750 mbar.
4. A process as claimed in any of claims 1 to 3, wherein the compression of the vapor is carried out using a turbocompressor.
5. A process as claimed in any of claims 1 to 4, wherein the vapor is compressed to a pressure in the range of from 2 to 5 bar in (iv) and the compressed vapor has a temperature which is in a range of from 8 to 20°C above the temperature of the medium vaporizing in the distillation column in (iii).
6. A process as claimed in any of claims 1 to 5, which additionally comprises the step (v)
(v) condensing the vapor obtained in (iv) and returning at least part of the heat of condensation to at least one vaporizer used in the distillation column employed in (iii).
7. A process as claimed in claim 6, which additionally comprises the step (vi):
(vi) cooling at least part of the condensate obtained in (v) to a temperature in the range of from 10 to 30°C in at least one heat exchanger and returning this part of the cooled condensate as reflux to the distillation

column used in (iii).

8. A process as claimed in claim 7, wherein propene compressed in the at least one heat exchanger used in (vi) is vaporized completely with depressurization.
9. A process as claimed in any of claims 1 to 8, wherein the energy stored in the bottom stream obtained in (iii) is at least partly used for heating the mixture (M1) before it is fractionally distilled in (iii).
10. A process as claimed in any of claims 1 to 9, which additionally comprises the steps (i) and (ii)
 - (i) reacting propene with hydrogen peroxide in the presence of a titanium silicalite catalyst and methanol as solvent to give a mixture (M0) comprising propylene oxide, unreacted propene and methanol;
 - (ii) separating off the unreacted propene from the mixture (M0) to give a mixture (M1) comprising propylene oxide and methanol.